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HABERSHON, DISEASES OF THE ALIMENTARY CANAL, 8 PAGES.

## GULSTONIAN LECTURES.

*On Fever and Inflammation.* Delivered before the Royal College of Physicians, London, 1859. By WILLIAM ADDISON, M. D., F. R. S., F. R. C. P.

LECTURE I.

MR. PRESIDENT AND GENTLEMEN.—If we carefully examine into the causes which produce disease, it will be found that, in a great majority of instances, they may be resolved into some violation or neglect of the natural laws upon which the healthy actions of the animal frame depend. So also, on the other hand, the means of cure in such cases will be found to consist in aiding and adjusting natural efforts to re-establish those laws and conditions which have been outraged or infringed. Let us observe what these natural efforts are.

In the repair of injuries to the human body, certain parts are healed by the growth or production of elements identical with those of the wounded texture. On the other hand, there are organs, injuries to which are repaired, not by the growth of elements identical with those composing the injured organ, but by elements of the same kind with those which are effectual for cure in the former cases. The result is that, in all examples, and in very different parts of the body, the elements of repair appear to have a common form or nature. Now, the parts which are restored by the production of elements identical with those composing the injured texture, are such as have the most general distribution in the body, and are ministering to the purposes of life in the lowliest or simplest manner.

For example: Fibrous and connective tissues and bloodvessels are everywhere present; no part of the body can be said to be without them; all these are speedily reproduced or repaired when injured or broken.

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Tendons, ligaments, and bones, are of a very general distribution: these also are repaired by new growths of tendinous and osseous tissues. But when we come to investigate the healing process in more special organs, it assumes a different aspect. For, if a portion of the muscular flesh be rent away by an accident, cure is effected, not by the growth of new muscular fibres, but by a growth of common fibrous tissue. So likewise, if a part of the lung, of the brain, or of the liver or kidney, be destroyed by accident or disease, cure, if effected in these instances, is so, not by a growth of the special parenchyma, but by a common fibrous tissue.

Upon this ground, then — namely, the common form of elements of repair — we purpose to review the human body as a structure composed of three orders or classes of parts: a common tissue; the blood; and parenchymatous organs.

I. *A Common Tissue: its several Forms and Uses.*—The areolar tissue is a common tissue diffused throughout the whole body. It invests the exterior, and enters with the bloodvessels into the interior of every organ. Its elements everywhere incorporate with the coats of the vessels. And in all fibrous membranes the elements of the membranous tissue between the bloodvessels are of the same kind with those forming the coats of the vessels.

In natural growth, in the embryo, areolar tissue is at first composed of cells and nuclei, and the coats of the bloodvessels, and those parts of the body which are hereafter to become tendons, ligaments, and bones, consist in the embryo of cells and nuclei also. As growth proceeds, the areolar tissue becomes fibrous; and, *pari passu* with it, the coats of the bloodvessels, tendons, and membranes generally, become fibrous. When growth has been completed, nuclei are found incorporated with the fibres in fibrous membranes, in the coats of the bloodvessels, in capillaries, in periosteum, and also intermingled with the elements of bone. Fibrous membranes and areolar tissue are modelled to the subdivisions of the organ they invest; and bones mould themselves to the soft parts they inclose. If the brain be monstrous at birth, the fibrous membranes and bones investing the organ are monstrous also.

In animals where the hair is party-coloured, the fibrous tissue of the skin is patched in corresponding lighter and darker shades; and in such cases we have observed the pia mater patched in similar shades, the pigment being incorporated in the coats of all the small bloodvessels. In some birds of dark plumage, the periosteum is almost black the tendons are tinged with black, and the coats of the bloodvessels are spotted black.

We have said that the elements of repair have a common form. In the human body all mechanical injuries, wounds, and fractures, are cured by a common granulation and fibrous tissue, which pass through the same phases of growth as the original connective tissue and bloodvessels in the embryo.

From pathological anatomy we know that plates of osseous tissue are often found incorporated in fibrous tissues, and also in the coats of the bloodvessels; nay, they sometimes hang loose in the form of *phlebolites* in their interior. In five instances of phlebolites examined by Dr. John Reid of Edinburgh, and in others observed by Dr. G. Burrows, Tiedemann, Otto, Carswell, etc., they were attached to the inner coat of the veins by thin fibrous cords. Dr. Reid describes them as hard bone; two of them were analyzed and found to consist of phosphate of lime, carbonate of lime, and animal matter in proportions similar to those existing in bone.

In some experiments recently published, it was found that the periosteum, when separated carefully from a bone and wrapped round a portion of the muscular flesh in a living animal, continued to generate or secrete bone around the muscle, as it would have done around the bone had its removal from it not taken place. And generally all fibrous tissues, both those of original and those of reparative growth, are disposed to, and do very frequently, take on a change to bone or osseous tissue.

These are the grounds upon which we argue a common nature or a common element in the bloodvessels, and in the fibrous and osseous tissues. Periosteum, pericardium, dura mater, pia mater, the coats of the bloodvessels, areolar tissue, tendons, ligaments, and bones—all these we propose to comprehend under the designation of Common Tissue, because they are all reparable by the production of conformable elements. They have a common mode of growth; and are all subordinate tissues—connective, blood-distributing, and supporting tissues.

Objections, no doubt, can be raised against

this comprehensive classification; but we shall endeavour to substantiate its propriety by numerous facts; and, when particulars are properly placed in harmony, they become united and form a class, which, if appropriate, may suggest laws fitted to form elements of higher inductions.

Blood, as it circulates in the living body, consists of a colourless fluid; and swimming in it are the red corpuscles. When withdrawn from the body by venesection, blood soon coagulates, forming an uniform soft solid, which is commonly of a deep red colour throughout. There are many occasions, however, where blood before coagulation separates into two parts; the uppermost fluid and colourless, the lower red. The former part, termed lymph, plasma, or liquor sanguinis, forms on coagulation a tough, white, fibrous clot, or tissue; the latter part contains the red corpuscles, and forms a much more loose or friable mass. This spontaneous separation of blood whilst still fluid into two parts, viz., the colourless element or plasma, and the red corpuscles, warrants the distinction we shall preserve and enforce between the fluid or plasma and the red corpuscles.

II. *Relations of the Common Tissue to the Fluid or Plasma of the Blood in Natural Growth, and in the Process of Repair, as observed in Common Injuries.*—The human embryo is a body which, in a brief space of time, grows from a microscopic mass of colourless cells into a complex structure composed, with other things, of numerous forms of fibrous tissue, bloodvessels, tendons, ligaments, and bones. At this time, the blood abounds most profusely in colourless or plasma elements. During pregnancy, the placenta, a mass of common tissue, and the bloodvessels of the uterus, are in active growth; and the blood of the pregnant woman abounds in colourless elements. On viewing the circulation of the blood in a living animal, if the part under observation be roughly handled or irritated, the colourless or plasma elements of the blood may be seen lingering upon or adhering to the coats of the vessels; whereas no such attraction is seen between the coats of the vessels and the red corpuscles. The ordinary process of repair involves new growth of bloodvessels and fibrous tissue; and, if blood be drawn from within the sphere of the action, it is found to be highly charged with colourless or plasma elements. The inference from these facts is, that the plasma or colourless elements of blood furnish material for the growth of the common tissue.

But what are the proverbial effects of common injuries? and with what phenomena is their healing or cure accomplished?

If a part of the body be scalded, it speedily becomes red, and a colourless fluid is effused beneath the epidermis; after a short time, the sore or wound heals spontaneously. In burns, the object inflicting injury is higher in temperature; its influence extends more deeply; a portion of the skin is killed. At first, the dead part adheres firmly to the living parts beneath; but afterwards, when a discharge of pus appears, it loosens, and may be easily taken away as a slough, without pain or bleeding.

Case.—A young lady with fever had been in bed fourteen days, and a slough formed on the lower part of the back. When first examined it was black and dry; it adhered very strongly to the parts beneath, and any attempt at its removal would have caused pain and bleeding. But, a few days afterwards, when a discharge of pus appeared, the slough gradually became loosened, and then peeled off spontaneously, without pain or bleeding.

In all cases, the detachment of a slough without bleeding is consequent upon the appearance of the purulent discharge; and when it has fallen off, a new tissue, termed granulations, comes into view. These consist of new bloodvessels traversing embryoniform elements; and they follow the same course of growth as the common connective or blood-distributing tissue in the embryo. Granulations change into fibrous tissue for the reparation of fibrous tissue, and into bone for the repair of bone.

But, before a slough can thus fall off, there must have been a severance of the bloodvessels and other bonds of connection which previously united the dead with the living parts. This severance is accomplished by granulations and pus, without any bleeding. And, as the new vessels of the granulations carry on the circulation of the blood, so, therefore, there is positive proof that the older vessels must have opened for communication with the new ones by alteration and absorption of their coats, without any loss of blood.

When a thorn has entered the flesh, if it be not speedily removed or taken out, abscess and ulceration appear in the parts

around; and thus the offending body is loosened and discharged. The action thus set up will go on until the offending body be cast out; whereupon the parts return to their natural state spontaneously.

Case.—A forgeman was struck in the eye by a small particle of iron, which remained impacted in the cornea. He had been suffering from the accident for three or four days. The eye was red, from preternatural vascular action; and through a lens the wound in the cornea was seen filled with pus, the particle of iron still sticking in the middle of the sore. Abscess and ulceration had taken place in the tissue in contact with the foreign body. And that they formed part of the natural effort to loosen and cast out the injurious substance, may be presumed; because, upon the removal of it by surgical means, abscess and ulceration ceased spontaneously, and the eye in a very speedy manner was restored to its natural state, without any further extraneous aid.

If the ends of a fractured bone be examined between the first and tenth day after the injury, the periosteum and medullary membrane are found torn; the neighboring soft parts swollen; and blood is effused between the fragments. The periosteum and medullary membrane have, both of them, lost their fibrous character at the place of fracture; both have become the seat of a mass of granulations, which grow in the form of rosy points, and unite, interlacing with one another, so that the fractured ends of the bone are surrounded on all sides by granulations. From the tenth to the twentieth day, the granulations assume a firmer and more fibrous character; they are converted into fibrous tissue. Between the twentieth and the sixtieth day, according to the age and constitution of the patient, the fibrous tissue becomes converted into a spongy, and finally into a compact osseous tissue.

The liver or kidney is sometimes the seat of a parasitical creature termed *acephalocyst*. In such cases, abscess and ulceration may take place in the surrounding tissue; and it is worthy of note to observe the outlet of the contents of the abscess frequently barred in all the most dangerous directions by a thickening and strengthening of the fibrous tissues, whilst, at the same time, in some safer point of the circle, the overlying tissues are thinned away by absorption. Likewise in the lung, if an abscess, the result of softening tubercles, be near to the surface of the organ, and therefore likely to discharge its contents into the cavity of the chest, the accident is provided against. Adhesions form between the wall of the chest and the lung. Fibrous connective tissue grows abundantly upon the threatened spot, whereby the escape of matter from the abscess in that dangerous direction is very often prevented.

When a bloodvessel has given way in the brain, a clot is formed, and the contiguous parts are softened by a species of abscess. If all other circumstances are favorable to recovery, reparation, in a great degree, is effected even in these cases. The walls of the abscess change into common fibrous tissue; absorption of all the fluid part of the clot ensues; and the new fibrous tissue fills the space which may have been occasioned by any spoiled or lost portion of the brain-parenchyma.

In smallpox, numerous pustules or abscesses appear in the skin. With the full growth of the pustules, the fever declines.

In all these examples, granulations and pus—abscess and ulceration—are established for the avoidance of greater dangers, for the purpose of throwing off dead and injurious matter from the living body. Nor can we doubt that the purulent discharge in such cases performs an office in the series of events as useful and necessary as the granulations. Granulations and pus are both of them forms of primitive or embryoniform cell-growth. Granulations are the basis of the new repairing texture; they are traversed by numerous new bloodvessels; and they change, as before said, into fibrous tissue where fibrous tissue is needed for cure; and this again changes into bone where bone is needed, as it is for the cure of a fractured bone. Pus, on the other hand, is incoherent, and seems by this special quality to be fitly an agent in the separation of sloughs, and in the discharge of other injurious matters from the body. The particles of pus are colourless, and granulations are red only by reason of the number of new bloodvessels which traverse them; for, when granulations are altering into fibrous tissue, the number of bloodvessels greatly diminishes; and then the texture resumes its natural or proper hue, which is colourless or white. Abscess and ulceration are terms which comprise the effects produced upon the older tissue by the growth of the new one; namely, the loss and absorption it undergoes.

Let us briefly recapitulate the facts, and state our conclusions.

At early periods of natural growth, and in pregnant women, where the placenta is growing, the blood *generally*, and, within the sphere of new growth for purposes of reparation, the blood *locally*, is highly charged with colourless or plasma elements. The fluid which exudes from the bloodvessels upon slight injuries—scalds, blisters, and scratches—scarcely differs at all from the plasma. The elements of granulations and pus are colourless, and hardly to be distinguished from the colourless corpuscular elements of the plasma which may be seen in some animals adhering to and accumulating upon the inside of the coats of vessels which have been irritated or wounded.

"The elements of exudations," says Rokitansky, "are found preformed within the vessels; and the character of the subsequent products is thus shown to be dependent upon inbred transformations of the blood, and more particularly of its plasma." Or as we, in somewhat different words, gave expression to the same fact many years ago, "Colourless corpuscular elements of the blood accumulate upon the coats of irritated or injured bloodvessels, and thereby change their character; and from the altered vessels issues the new product, both in repair and inflammation."

Our conclusion is, that a common connective blood-distributing tissue is diffused throughout the whole body; that bloodvessels, fibrous tissues, and bones, are forms of this tissue; and that, in all cases of injury—wounds and fractures—cure is accomplished by new productions of this tissue, the materials of which are derived from the fluid of the blood.

There is, then, a more intimate relation between the fluid of the blood and its containing vessels than between them and the corpuscles of the blood. And bloodvessels are quickly repaired and reproduced, because their coats are constructed of elements of the plasma—elements which readily corpusculate and fibrillate.

A slough of the skin or outer integument is thrown off easily, without bleeding. In such cases, we presume, therapeutical reactions, comprising suppuration, ulceration, granulation, and purulent discharge, are observed under the best circumstances.

In carbuncle, the dead tissue lies beneath the living skin. The process of separation is therefore protracted until a free outlet has been made either by the natural efforts, or by the knife of the surgeon. In common issues, granulation and suppuration may be almost indefinitely protracted by keeping peas in the sore. In necrosis of bone, the dead bone lies beneath the living skin; nay, sometimes it is included within a shell of new-grown bone. In all these cases, granulation, suppuration, and ulceration, are protracted or chronic. The protraction, however, is not chargeable upon any pathological action; the action is physiological, tending to repair; but success is hindered by physical difficulties, as in the following example.

Case.—George S., aged 18 years, was admitted into the Sussex County Hospital on April 1st, 1857, under the care of Mr. Lowdell. He had suffered for four years from necrosis of the tibia. Portions of dead bone had from time to time been removed; but no great benefit had resulted. He had now two fistulous openings—one at the upper end of the bone, the other close to the inner ankle—through both of which dead bone could be felt. The intermediate portion of the leg presented that chronic thickening and inflammation of the skin which usually arise from long-continued disease. He was anxious to undergo any operation; for the continually repeated attacks of inflammation impaired his health, and rendered him unfit for any work.

Chloroform was administered; and an incision was made along the front of the upper part of the tibia, so as to include the upper opening and penetrate to the bone. Dead bone could now be seen; but the opening through the new bone was so small that it required enlargement before any portion of the sequestrum could be taken hold of.

"I now found," says Mr. Lowdell, "that the dead bone reached downwards the whole length of the tibia; and then began the physical part of the operation—the trephining, chiselling, and gouging through new bone, so hard and thick that the proceedings were more like those on a carpenter's table than operating on a human subject. The opening made in this man's tibia was eight or nine inches in length, more than an inch in depth, before all the dead bone could be removed."

The recovery was complete and satisfactory. In a few days after the operation, the surface of the bone was covered with granulations; new integuments formed; and in

less than three months the patient was discharged cured. His leg was, in June, 1858, as strong as the other.

In this case, it is demonstrated, as much as anything of the kind can be, that the action which had been going on for years, and which contributed to weaken and disable the patient, was not a diseased action, in any proper sense of the terms. On the contrary, it comprised the resistance opposed by the living tissues to the decomposition of the dead bone.

The fistulous openings were outlets for the discharge of spoiled and offending matter, necessary so long as the dead bone remained: and, because the reactions cannot effect the expulsion of dead bone in diseased joints and other cases, we have no warrant, therefore, without heed of the surrounding circumstances, to invest them with an exclusive pathological meaning. Therapeutical reactions (as in the case related), when opposed by insurmountable difficulties, may contribute to weaken and undermine the health of a person; but without them the decline of the life of the patient would be the more rapid, because the decomposition of the dead bone would, in such case, be speedily communicated to the contiguous tissues. In all severe injuries, compound fractures, crushed joints, contusions, and lacerations, inflammation, suppuration, granulation, and purulent discharge, must be regarded as phenomena of therapeutical reaction, notwithstanding that, from the severity of the accident or other causes, the health and life of the patient may be endangered in the process.

It follows, then, that forms of inflammation, granulation, pus, suppuration, and ulceration, are ordinary phenomena of therapeutical reaction in injuries and disease of the common tissue. The action is between the bloodvessels and the plasma or fluid of the blood; and protraction or chronicity, or even danger to life from physical hindrances, does not impugn the idea or exclude the conception of a process established for reparation, though it should fail.

In the examples we have particularized, the common tissue takes the initiative, as it does in all mechanical injuries. Let us, then, now proceed to speak of the other element—the other moiety, as it were—of the action; namely, the fluid or plasma of the blood.

III. *The Fluid or Plasma of the Blood.*—The plasma is a very complicated fluid. Its chief constituents are water, fibrin, albumen, colourless corpuscles, volatile matter, fatty compounds, and salts. In its passage through the capillary vessels, it permeates all organs and tissues; and, at various points of the circulation, the parenchymatous depurating organs remove from it those substances which, if retained in it, would injure its qualities. We find that numerous soluble compounds—substances, for instance, which have been taken as food or drink, and poisons received into the stomach—are absorbed into the plasma, whence they may be again eliminated or removed, changed or unchanged by the depurating organs—the organs of secretion.

Many of the common poisons have a local action as irritants, and also a remote or special action upon some parenchymatous organs; other poisons exhibit only the remote or special action. Cantharides has a special action as an irritant to the stomach; it also affects remotely, through the plasma, the urinary organs. Morphia, taken by the stomach, affects specially the brain, through the plasma. Digitalis, taken by the stomach, affects the heart; strychnia the spinal marrow, through the same medium.

In experiments on animals with prussic acid, it has been found when death took place within a few minutes only, that the odour of the poison could be perceived in the cavities of the body; and again in other experiments, where preparations of antimony were injected into the blood by a vein in the thigh, the metal has been found in the coats of the stomach.

From these and numerous other facts, which it is unnecessary to particularize, we learn that poisonous substances, taken by the stomach, enter the plasma or mingle with the fluid of the blood; and thereby the poisoning, not of all, but of some one parenchymatous organ ensues, determined by the nature of the poison, and the special qualities of the parenchymatous elements of the different organs. But if we compare the actions of these common poisons received into the body through the stomach, with the action of aerial poisons inhaled by the lungs, important differences will be found. In the former, the symptoms do not begin with fever, nor is any contagious matter generated in the blood; whereas both these phenomena are distinguishing features of the latter. Here, then, we have a ground for our argument, that the two parts of the blood have

distinct pathological relations; for poisons taken by the stomach exhibit themselves by symptoms which proceed from some local parenchymatous organ, and they do not cause the production of a contagious matter in the blood; whereas poisons inhaled from the atmosphere by the lungs very often do so. Yet both species or classes of poisons act through the medium of the blood.

In 1832, numerous cases of cholera, then epidemic, were treated by saline injections, thrown into the blood in large quantities, not only without hurt to the patient, but in some instances with great apparent benefit. Among many others, there is a very remarkable case reported in the *Lancet* (vol. ii., 1831 and 1832), in which five gallons of saline liquid were injected by a vein, in four days.

The first injection was to the amount of nine pounds and a half; it was thrown into the circulation in the space of eighteen minutes. A few hours afterwards an additional ten pounds of the saline fluid were injected, with four ounces of albumen. This was at one of the clock on the morning of May 29th. At half-past seven of the same morning the injection was repeated to the amount of ten pounds, with the addition of ten grains of sulphate of quinine; at half-past eleven, the injection was repeated to the amount of ten pounds. On the 2d of June, at half-past four in the morning, six pounds and a half of the saline fluid were injected, with six drops of a solution of morphia; and on the 19th of June the patient is reported to have left the hospital, well.

If we look around, we may see in all classes of society individuals of various conditions of body. We may contrast the florid complexion with the pale thin face; tissues laden with fat with the spare habit; those who luxuriate in good living with those existing on bread, potatoes, and water. Persons in each of these classes may be following their daily avocations in good health, yet the blood fluid, we know, cannot be the same in all of them; nor can it be the same or have the same qualities in the same person, if he greatly alter his diet, his food and drink. In the chemistry of the blood, there are scarcely two analyses of it alike; and the milky serum sometimes seen in blood after venesection has been referred to articles of diet, or to the recency of a meal, which has for a time changed the qualities of the plasma.

These facts support or coincide with our argument that the blood must be regarded in respect to its pathology, as consisting of two distinct parts; and of these, that the plasma or fluid holds a position of different or inferior rank to the red corpuscles in the functions of life. It furnishes elements of growth and reparation to its containing vessels, the common tissue; and it is the medium in which the corpuscles swim; but it varies within certain limits, in qualities and composition, from day to day, according to the nature and abundance of the food and drink; nay, further, it appears that it may vary, in quality and composition, from poisonous substances taken into the stomach, so as to occasion symptoms of poisoning in some local parenchymatous organ, before any of the symptoms of fever appear, and without evidence of the generation of any contagious matter in the blood.

IV. *Distemperatures or Dyscrasies of the Plasma or Fluid of the Blood.*—There are varieties or changes of health—moods, tempers, and feelings—dependent upon qualities of blood which are temporary, multifarious, and fleeting. They are cured by attention to diet and the excretions; by good living in those who have fared badly, or are half-starved; by abstinence and physic in those who have abused the good things of the table. These changes in the moods and feelings of the individual have all the characters of dependence upon that part of the blood which is quickly replenished and altered by diet—namely, the plasma.

Also there are numerous forms of inflammation which are uncertain and multifarious—dependent upon qualities of blood occasioned by unwholesomeness of diet, privations, and neglect of the functions of the depurating organs—the skin, kidneys, and bowels. Sometimes the simplest wounds fester and ulcerate. Eruptions, pustules, or boils break out in the skin; or the slightest external injury provokes chronic and ulcerative forms of inflammation without fever, comprehended in the terms scrofula and scurvy. For example:—

Sailors at sea are dieted on salt provisions; and in hot climates are accustomed to tramp about the ship without shoes or stockings. Their feet and legs are consequently bitten by mosquitoes, and, when the men have been a considerable time on a salt diet, and in the hot climate, the wounds ulcerate. The ulcerations become larger every day, and will resist all kinds of local treatment,

so long as the diet remains unchanged. But, upon a change of diet, and cruising in a cooler latitude, the ulcers heal spontaneously.

Under analogous conditions—of unwholesome or insufficient diet or confinement—fractures in a hospital will remain only partially united; but, upon the patient's removal into the country, cure is completed.

When a patient undergoes a formidable surgical operation, and makes a good recovery, the blood is regarded as of normal constitution, free from any taint or distemper. On the contrary, when trifling wounds and accidents degenerate into chronic ulcerations, it is reputed unhealthy. And the unhealthiness or impurity may be limited to the plasma, or that part of the blood from which the elements of repair are taken. At all events, it is a question or matter for inquiry, which part of the blood is most in fault in these cases. "A person shall have a sore upon the leg, which is granulating freely," says Mr. Hunter, "when all at once the granulations shall lose their life and fade away. New granulations may afterwards spring up, and these shall undergo the same process, and so they would continue to go on, if some alteration in the nature of the parts be not produced." That is to say, some alteration in the plasma or fluid of the blood; differences in the nature of granulations being determined by differences in the qualities of the plasma. These examples are sufficient to show—what indeed is well known—that forms of inflammation, suppuration, and ulceration, are produced and kept up by distemperature or unhealthiness of blood, and more particularly of its plasma. And that a depurative operation is often performed on the plasma, by forms of local inflammation, may be argued from the eruption of smallpox. In scarlet fever, that a contagious matter from the blood is discharged by the vascular action in the skin, may be concluded from the properties of the particles of the exfoliating epidermis. And in gout, that offending matter is discharged from the blood by the local inflammation, is also to be concluded from the morbid material deposited in the parts inflamed.

For demonstrative evidence of forms of inflammation dependent on distemperatures or dyscrasies of the fluid of the blood, we may refer to the *chef d'œuvre* of pathological anatomy, the great work of Rokitansky, also to the lectures of Mr. Paget. Actual proof of alterations in the qualities of the plasma may often be obtained by venesection, in cases of inflammation. The speedy separation of the plasma, or sinking of the corpuscles, which occasions buffed blood, indicates a change in the relative qualities of the two parts of the blood. We have recorded the yellowish, greenish, and purplish hues, and the flocculated appearance like curdled soap in the plasma, of buffed blood before its coagulation in different cases of inflammation. And we have repeatedly observed with the microscope differences in elements of the plasma of blood, taken from within the sphere of inflammation, as compared with elements of the plasma of blood drawn exterior to it. It would seem, then, that abnormal qualities of the plasma promote forms of inflammation; and the disposition of the colourless corpuscles of blood to congregate and attach themselves to the coats of the vessels, we may suppose to indicate a way whereby disqualified or abnormal portions of the plasma are transferred to the common tissue for discharge.

In the first part of this lecture, we spoke of the severance of bloodvessels and other bonds of connection between sloughs and the subjacent texture without bleeding. In abscess and ulceration, from thorns and other foreign bodies impacted in the flesh, we showed that great changes take place in bloodvessels without bleeding.

In fact, in all cases of repair, where exudations and new growth appear, the bloodvessels engaged undergo a change from fibrous to corpuscular—their component elements retrograde. This change is exemplified in granulations—the vessels of which bleed upon the slightest touch. We have a perfect conviction that, in places of inflammation, from disordered qualities of the plasma, the coats of the bloodvessels undergo the same changes; for we find that corpuscular elements of the plasma form, not only the coats of new vessels which arise during inflammation, but also supplant the fibrous element of the coats of the older vessels, which must be opened to supply blood to the new ones; and, as the plasma is the part of the blood which plays the conspicuous part in these changes, so it is not difficult to comprehend how it may be relieved of hurtful materials in a place of inflammation.

"That sores give rise to very different kinds of pus," says Mr. Hunter, "is very

evident to the naked eye, and the different parts of which the blood is composed, will come away in different proportions we can make no doubt; and we find that whatever is in solution in the blood comes away more in one kind of pus than in another." The inference is, that inflammation exercises a therapeutical action in distemperature of the fluid of the blood. Hence, then, inflammation, exudations, granulations, and pus, may arise for two distinct purposes, namely: for the cure of mechanical injury; for the discharge of sloughs and foreign substances from the solid textures; and as a means of cures in distempered plasma.

In injuries to the common tissue, wounds, lacerations, contusions and fractures, the process of repair comprises inflammation, granulation, suppuration, and ulceration; new bloodvessels are formed without bleeding, and there are discharges of pus. If physical hindrances interpose, the process is protracted and made chronic until they are removed. If they cannot be removed, the life of the person is endangered, and may be destroyed unless amputation be performed.

In distemperature or injury, to the quality of the fluid of the blood, by unwholesomeness of diet, privations, or other causes, reactions of the same kind arise for its depuration. These also comprise inflammation, granulation, suppuration, and ulceration; boils, pustules, eruptions, and gout. If hindrances interpose—if the causes of the distemperature comprised in errors of diet, privations, etc., be not abated, the process is protracted and made chronic until they are removed, and in such cases, as in the sailor's before mentioned, to cure the local affection (the ulcers), the qualities of the plasma must be altered or improved by a thorough change of diet or habits of life.

In the one group—injuries to the solid texture (surgical cases)—the reactions arise for the healing of wounds, the discharge of sloughs, dead matter and foreign bodies. There is direct evidence of what occasions the action, what it accomplishes, and why it is protracted and dangerous. In the other group—disorders of the blood (medical cases)—the influence of the reaction upon the qualities of the fluid of the blood can only be inferred from collateral events; and these in gout, smallpox, and the other exanthematous fevers, point unequivocally to the therapeutical characters of inflammation.

In perusing such cases as Mr. Lowdell's, we cannot fail of remarking the advantage the surgeon has over the physician, in being able to go safely beyond the things which are seen. At the bottom of fistulous and ulcerated openings in the flesh, beneath an inflamed and thickened integument, and through a thick crust of new-grown bone, he is able to assist, or rather to accomplish the task nature has long been endeavoring to perform. He lays his hand upon the hindrance which has made inflammation chronic, plucks it away, and the person is restored to health. Likewise in other severe injuries, a compound fracture or a crushed joint, the surgeon surveys the whole of the injured parts, and he has time and opportunity, before therapeutical reactions set in—before inflammation, suppuration, granulation, and ulceration have commenced—to form a judgment of the most probable course of events; and if, upon consultation, serious doubts be entertained whether or not the cure should be intrusted to the natural course, he amputates the limb.

The physician is very differently placed. The inflammations he has to deal with arise from qualities in the blood itself; and when he has protracted and dangerous forms to deal with, he cannot lay his hand upon the cause of danger and take it away.

From the facility with which reactions between the fluid of the blood and its containing vessels may be studied in mechanical injuries, has arisen the *doctrine of repair*, daily exemplified in numerous examples.

But reactions of the same kind, from changes in the quality of the blood itself, owing to the difficulties surrounding their explication, have been separated from the ordinary process of repair. Our object will be to accumulate evidence of the propriety of bringing all reactions between the plasma and the common tissues, the process of repair and inflammation into one—the physiological—category, and to show that failure of success, in cases of inflammation of blood-origin, no more alters the nature or intent of the action, than does failure of success in necrosis of bone, and in other surgical cases. But further argument upon this matter must be reserved until we have spoken of the corpuscles of the blood.

V. *Of the Red Corpuscles of the Blood.*—The development of the red corpuscles of blood is doubtless conducted on the same principle as that of other cells. They take from the plasma, in which they swim, the

materials requisite for their growth, and excrete the products that must be consequent on the act of absorption.

"The only hypothesis," says Dr. F. Simon, "regarding the preservation and growth of the blood-corpuscles, is that their increase in bulk is due to a reciprocal action between the young corpuscles and the plasma; and that, as independent organisms in circulation, every change which occurs in them must be accompanied by a simultaneous alteration in the plasma, from which they obtain their nutriment, and into which their excretions must pass." And of the excretions passed into the plasma, those of them which are injurious are withdrawn therefrom by the depurating parenchymatous organs—the secreting parts of the skin, liver, and kidneys.

Now, if we treat the red corpuscles as independent organisms, swimming in the plasma, then any matter or substance, whether derived from the plasma or from the atmosphere, which is necessary to their sustenance, to their normal state and functions, may be regarded and spoken of as nutriment. That is to say, we may speak of the corpuscles of the blood as nourished by elements in the air, as well as by elements of the plasma; and, as respecting the matter they excrete or discharge, it is a part only of their excretions which is passed into the plasma: for certainly another part of their excretions is discharged into the air in the form of carbonic acid, by respiration. Let us pause for a moment to consider this matter. The leaves of a plant take in part of the materials of the nourishment of the plant from the atmosphere, and they excrete or discharge into the atmosphere elements that would be injurious to the economy of the plant if retained in it. Also the rootlets of a plant take up other materials of nourishment from the soil, and they excrete into the ground matters which they do not want. In both these examples, in the roots and leaves of the plant, the bodies which perform these offices of absorption and excretion are microscopic cells—organisms analogous, and in many respects similar, to the blood corpuscles.

Animals inhale the air and discharge into it matters which are thrown out from the body by respiration; and, in their nutrition by diet, they cast their droppings or excretions upon the herbage on which they must afterwards feed.

Unicellular animalcules, in a drop of water, derive from it elements of their nourishment, and also they must discharge into it the matter of their excretions. In a *vivarium* water is the medium sustaining different forms of life, and the fluid is preserved in a fit and proper state because the excretions of the animal furnish nutriment to the bodies of vegetable life, and because, on the other hand, the excretions of the vegetable furnish elements of nourishment to the animal bodies; the excretions of one department of life furnishing food and necessaries to the other department.

There is, therefore, nothing incongruous in the corpuscles of blood taking part of their nourishment from the air, and discharging into it a part of the matter of their excretions; and in their taking another part of their nutriment from the plasma, and discharging into it another part of their excretions. Nor, again, is there any incongruity in our finding that the plasma, or fluid of the blood, maintains its purity because the excretions of the corpuscles are ingredients upon which the functions of the depurating organs are exerted. Nor, finally, if, with Zimmermann and Simon, we should regard the fibrin of the plasma as an exuvial matter, or excretion of the corpuscles, is there any incongruity in finding it to be an essential material, used in the maintenance and repair of the common blood-distributing tissue.

As respects matter passing from the corpuscles into the plasma, we are able to show, by some remarkable experiments which will hereafter be fully related, that molecular and tailed forms of some material substance may be seen issuing out of them and passing into the plasma, without much alteration of their form or colour; and to any one witnessing the experiment, there can be no difficulty in concluding that the corpuscles, in their natural state, discharge matter into the plasma. It must be confessed that but little can be demonstrated of the vital and depurating processes constantly going forward in the blood of the living person. Nevertheless, in the absence of such demonstration, we are warranted, by the experiment just referred to, and by the undisputed teaching of physiology, in concluding that the corpuscles of blood are sustained in their vital and chemical qualities by the plasma and the air; also, that their excretions are passed, partly into the plasma and partly into the air; and

these properties of the corpuscles being established, there are some broad and acknowledged facts respecting venous blood and urea which claim our attention.

VI. *The Corpuscles of Blood, in the Performance of their Natural Functions, contain and excrete matter which is poisonous to the Brain.*—Blood is distributed by arteries; it returns by the veins. There is a great difference between arterial and venous blood. This difference is, for the most part, if not entirely, referable to the corpuscles. The red colouring matter is contained within them, and the bright colour which is communicated to blood by oxygen, as well as the dark shade which is induced by the transmission of carbonic acid through it, are the actual shades of colour which we see in arterial and venous blood. Venous blood is necessary to the well being of the liver, and also to the normal function of the lung; but should venous blood be transmitted by arteries to the brain, it is well known that symptoms of poisoning begin.

No suggestion for the recovery of drowned persons has been attended with so much success as the "Ready Method" of the late Dr. Marshall Hall. The principle, therefore, upon which his method is founded, may probably be accepted as true.

"During the circulation," he says, "the oxygen inhaled by respiration unites with the carbon of the blood, forming carbonic acid, which is exhaled in its turn by respiration, except in cases where the respiration is suspended, as in drowning and other forms of apnœa. In apnœa, the carbonic acid retained in the blood poisons it; and the organs, beginning with the brain and spinal centre, are in their turn poisoned by this blood-poison. The circulation," he goes on to say, "without respiration, is a blood-poisoning process; respiration is a de-poisoning process. By respiration the carbonic acid poison, formed during the circulation, is eliminated from the blood and evolved from the system."

The consumption of oxygen and the formation of carbonic acid stand in a direct ratio with the number or amount of the blood-corpuscles, and with the number of respirations made in a given time. It is well known that the alteration of colour from arterial to venous, which blood undergoes by circulation, is an alteration which takes place *within the corpuscles;* also, that the re-arterialization of blood by respiration involves a change in the corpuscles. It must be, then, that the qualities acquired by blood during circulation, and discharged by respiration, are qualities of the corpuscles, inasmuch as the change of colour, which denotes the change of quality, is observed in the corpuscles. When, therefore, symptoms of poisoning arise from the circulation of venous blood through the brain, the poison must be concluded as contained within, and as generated, or produced by, the corpuscles.

Urine is a fluid separated from the blood by the kidneys; and urine contains a substance which, when applied to other tissues than those of the kidney, will act as a poison. Sir H. Halford met with five instances of suppression of urine in the course of seven-and-twenty years' practice, and in every instance the patient died from poisoning of the brain. It is but reasonable to infer that urea, which is separated in large quantity from the blood by the kidneys, should be a product of the metamorphosis of a substance of an invariably uniform composition.

"Amongst all the higher classes of animals," says Dr. Simon, "and many of the lower, in the most varied forms of existence, and under the most opposite kinds of food, we find urea and uric acid, or one of the two, as a constant secretion of the kidney. It seems opposed to all reason to imagine that, in animals as different in structure as they are opposite in their habits of life, and under every possible variation of circumstances, these fixed and definite compounds should be products of the metamorphosis of the plasma. It is easy, however, to conceive that the corpuscles which, although different in their form, are similar, if not identical, in their chemical constitution, in the blood of all animals, should yield similar products as the result of their metamorphosis."

If this reasoning be admitted—and it is urged with much force and perspicacity by Dr. Simon—it follows that urea, or a nitrogenous substance represented by that compound, and withdrawn from the blood by the kidneys, is an excretion of the corpuscles discharged into the plasma. Hence carbon or carbonic acid is an excretion of the blood-corpuscles discharged at once into the atmosphere; whilst urea is an excretion discharged into the plasma, and withdrawn therefrom by the action of the kidneys. Both these substances, if unduly retained in the blood, act as poisons to the brain; and we must conclude that the corpuscles of blood,

in the performance of their natural functions, generate matter which is poisonous to the brain. Halitus within the corpuscles, if not discharged by respiration and other excretions, if retained in the plasma, are poisonous.

The properties of the corpuscles, then, substantiate the argument drawn from a consideration of the properties of the plasma, as to the necessity for holding the two parts of the blood distinct, pathologically as well as physiologically. The corpuscles are independent organisms, and the plasma is the fluid in which they swim. The properties of the one are very different from the properties of the other.

VII. *Relations of Diet to the Plasma, and of Air to the Corpuscles.*—The normal condition of the blood is preserved by diet and respiration. The alimentary canal and the lungs are the only two channels by which outward material substances are received into the interior of the body. Both have reference to the blood; diet, or food and drink, to the replenishment of the plasma; air to the nourishment of the corpuscles. The alimentary canal is, as it were, the coarser way by which substances are received into the body; whereas, in the structure of the lung, everything is fashioned with special reference to the admission of aerial elements into immediate contact, as it were, with the highest elements of the circulating fluid—the corpuscles of the blood.

As the plasma is subjected to a continuous change and consumption during the nutrition of the body, it becomes a matter of necessity that it should also receive a continuous supply. This is afforded to it by the chyle. Chyle is derived from substances received into the stomach—food and drink; it mingles with and augments the bulk of the plasma; and it is from the plasma that the red corpuscles derive part of their nutriment. There is, therefore, a more intimate relation between diet and the fluid of the blood, than between diet and the corpuscles; that is to say, any substance or poison entering the blood from food or drink must first enter and mingle with the plasma, before it can come into contact with or affect the corpuscles. But the case is different as between the corpuscles and the atmosphere.

From the peculiar distribution of the capillaries, and from the extreme thinness of the walls of the pulmonary air-cells, the blood-corpuscles are brought in the lungs into almost immediate contact with the air, and with the substances contained in solution in the air. The absorption of air through the humid membrane of the air-cells of the lungs is facilitated by the immense extent of surface presented, over the whole of which a thin stratum of blood-corpuscles is simultaneously exposed to the atmospheric influence. The permeability of moist membranes by fluid and gaseous substances is a well known fact; dark or venous blood inclosed in a moist bladder, and exposed to the air, soon assumes the arterial tint.

"I asked Mr. Boulderson," says Bishop Heber, in his *Narrative of a Journey through the Upper Provinces of India*, "if it were true that the monkeys forsook these jungly forests during the unwholesome months. He answered that not only the monkeys, but everything which has the breath of life, instinctively desert them from April to October. The tigers go up to the hills; the antelopes and wild hogs make incursions into the cultivated plains; and those persons, such as dâk-bearers and military officers, who are obliged to traverse the forests in the intervening months, agree that not so much as a bird can be heard or seen in the frightful solitudes; yet, during the time of the heaviest rain, while the water falls in torrents, and the cloudy sky tends to prevent evaporation from the ground, the forest may be passed in tolerable safety. It is in the extreme heat, and immediately after the rains have ceased, in May, the latter end of August, and the early part of September, that it is most deadly. In October, the animals return. From the middle of November to March, troops pass and repass; and, with common precaution, no risk is apprehended."

This may be an extreme instance, but it is one of a very numerous class. It is well known that miasms or poisonous substances are diffused through the air, and that they exist in a very concentrated form at certain times, in particular localities. To enter in detail upon this topic is quite unnecessary. The question which arises upon the view we have taken of the constitution of the blood—of the relations of diet to the plasma, and of air to the corpuscles—is, whether the contagious fevers to which aerial poisons give origin are to be referred to the plasma, or to the corpuscles.

VIII. *The Corpuscles of the Blood have a Property of Resistance against injurious*

*Agents; they are not disordered or disturbed by every Quantitive Change in the Plasma.*—First, as respects symptoms of poisoning through articles of diet, or through substances taken by the stomach, in food or drink: the poison enters the plasma, mingles and circulates with it. Through the plasma it must reach all, but it may affect injuriously one only of the parenchymatous organs: for example, mercury the salivary glands; opium the brain; strychnia the spinal marrow; digitalis the heart; and so on of many other poisons which exhibit their action according to the affinities of the different parenchymatous organs for particular poisons. In all these examples, the symptoms begin in, and may be limited to, some local parenchymatous organ, notwithstanding the general distribution of the fluid which contains the poison. It cannot be disputed that the same poison does not act equally upon all the parenchymatous organs, though all may be exposed to its presence. Some suffer derangement; others do not. And if, to account for these special phenomena in one organ only, we introduce the doctrine of affinity or predilection, we must also allow to those parenchymata which escape a measure of indifference or resistance. This teaching holds a prominent place in chemical philosophy. Affinities and resistances are as often argued of inorganic as of organic or living bodies.

The corpuscles of blood are quite as much a group or community of independent organisms as are the special elements of the liver, brain or kidney; and, if the elements of one parenchymatous organ can remain indifferent to or resist the injurious action of a poison circulating in the plasma whilst the elements of another are suffering from it, it is not unreasonable to infer a similar property of indifference or resistance in the corpuscles of blood. We have frequently tried the effect upon the corpuscles of substances which, if present in the plasma, will poison the brain or nervous centres, such as solutions of prussic acid, morphia, and strychnia; and we find they produce no other or more effect upon them than so much water.

But, without relying upon experiments of this kind, we take the general principle, and argue for the blood-corpuscles the same kind of properties as is allowed to other cellular elements to the elements of the parenchymatous organs. And we say the blood corpuscles may resist the action of, or be indifferent to, sundry matters in the plasma, which may nevertheless be producing disorder in some local parenchymatous organ. Let it be observed, the argument does not assume that poisons which first affect the brain or other local organ will not affect the corpuscles also, if in sufficient or overwhelming quantity; but only that there are many substances which, being present in the fluid of the blood in small quantity, will affect its qualities injuriously in relation to a parenchymatous organ before sensibly disturbing the corpuscles.

Secondly, as respects poisoning of blood through miasma in the atmosphere; it is here to be observed, that the poison is received through the lungs, where the corpuscles are brought into contact with the air, and with the things in solution in it; and where, moreover, as has been shown, the physiological function performed is one specially between the corpuscles and the air. The change which blood undergoes in the lungs is specially a change in the corpuscles.

Through diet, and through the atmosphere, elements of blood-disorder may enter. Through the former, the plasma or fluid, through the latter the corpuscles, are first affected. The qualities of the plasma undergo numerous limited changes, from diet, and from various other substances received through the stomach. But it does not follow, necessarily, that the corpuscles must suffer a disturbing change in consequence thereof. They have, up to a certain extent, a property of indifference, non-affinity, or resistance; and therefore maintain their normal constitution and function under various limited alterations of the fluid in which they swim.

On the other hand, from contact of the blood with poisonous substances in the atmosphere, the corpuscles, by reason of the special function of respiration, may be the first part of the blood to suffer disorder; whereupon their disordered condition is reflected upon the plasma, because this fluid is the depository of their excretions. That is to say, from errors in diet, or from poisonous substances taken by the stomach, the blood may be deteriorated in one only, and that the least important of its parts—namely, the plasma; whereas, from poisonous substances in the atmosphere, blood may be deteriorated, commencing with the corpuscles. And, as it cannot be denied that a

poisonous quality in venous blood is referable to the blood-corpuscles, so therefore the question arises, whether pathological poisons—if we may so call them—the virus of smallpox, and other contagious poisons, are not also to be referred to the corpuscles of the blood; and, should this proposition be established, the physical difference between the two parts of the blood rises into great importance.

Let us briefly recapitulate the physiological facts upon which we shall rely in our future discussion of phenomena of fever and inflammation.

The corpuscles of the blood are independent organisms, swimming in the plasma, deriving from it and from the air, materials suitable to their growth and functions, and discharging into it and in the air, the matter of their excretions, namely: carbon, or carbonic acid, into the air, and a nitrogenous compound, or urea, into the plasma. Depurating organs, located at various points of the circulation, withdraw from the plasma the matters which, if retained in it, would injure its qualities or composition, and the elements of the different depurating organs have different or special affinity for different substances in the plasma. We have dwelt specially on the change which the corpuscles experience in their colour by exposure to the air in the lungs, and upon the poisonous quality they acquire if the normal change is not effected; and we have shown that these bodies, if they take or select from the plasma and from the air materials suitable for their maintenance, must have, in common with other cellular bodies, a property of indifference, or resistance to some extent, against deleterious substances.

As respects the plasma, or fluid of the blood, we have noticed the close relation between it and articles of food or drink through the chyle. Substances received into the stomach in diet, and poisonous substances taken in the same way, my be speedily detected in the secretions; therefore the plasma must be a fluid of variable composition: and its relatively inferior position to the corpuscles was argued from these facts, and from the treatment of cases of cholera in 1832, by large quantities of a saline injection thrown into the blood.

The conclusions to which we have arrived are:—

That changes in the qualities of blood from errors in diet, or from poisonous substances taken through the stomach, commence in, and may be limited to the plasma; whereas changes in the qualities of blood, from poisonous substances dissolved in the air and inhaled by the lungs, may commence in the corpuscles. In the latter case, both parts of the blood become disordered, not simultaneously, but in succession; the corpuscles first, and then the plasma.

These conclusions are not strained to support any favourite theory. The great physical difference between the fluid and the corpuscles of blood; the absolute manner in which the fluid depends upon diet, food and drink; the contact of the corpuscles with the atmosphere in respiration; the change in their colour and properties which ensues; the matter poisonous to the brain which arises within venous corpuscles; the action of the depurating organs upon the plasma, exhibiting special affinities;—all these are received doctrines of physiology, or flow logically from them; and we make them the basis of a therapeutical doctrine in blood-diseases, distinguishing between the fluid and the corpuscles.—*British Med. Journ.*, April 23 and 30, and May 7, 1859.

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## CLINICS.

### HOSPITAL NOTES AND GLEANINGS.

*The Flexion Treatment of Popliteal Aneurism.*—The new method of treating popliteal aneurism by bending the knee and retaining it in that position, as adapted with success by Mr. Ernest Hart, and subsequently by Mr. Shaw, does not seem to have been productive of good results in the few cases in which it has as yet been tried in the London hospitals. In a case under the care of Mr. Moore in the Middlesex Hospital the aneurism, which was an unusually large one, gave way into the joint during treatment by flexion. That the position mentioned might easily increase the liability to such an occurrence may readily be conceived, more especially when the aneurismal sac is placed on the articular aspect of the artery. Mr. Moore's patient, despite the formidable complication alluded to, made a good recovery after ligature of the femoral, and the effused blood was absorbed from the joint without causing any material irritation.

Mr. Paget has at the present time a case

under treatment in Harly ward which bears some similarity to the above. Fortunately the joint has not become implicated; but there can be no question but that during the flexion treatment, which lasted only a few days, the aneurism enlarged, and that much irritation was set up around it. The patient is a fair healthy man, aged 30, and the aneurism is situated in his left popliteal space. It had existed about five weeks, and was of large size when a fortnight ago he was admitted into the hospital. So much increase in the size of the tumour, tenderness about it, and swelling of the cellular tissue took place that the propriety of immediate ligature was discussed in consultation on Friday last. It was feared that the sac might be about to give way. It was decided to wait and watch the further progress of events. On Saturday Mr. Lawrence and Mr. Stanley again met Mr. Paget at the man's bedside. The condition of things was no worse in any respect than the day before, in fact, the pulsation seemed rather less. Mr. Paget remarked that he was loth to resort to the ligature prematurely, as in many of the cases in which the compression plan had succeeded, consolidation had ensued unexpectedly after just such a blaze of irritation in and about the sac as was now taking place. He, therefore, preferred still to wait, having the tumor narrowly watched, and being prepared to ligature at once should the sac give way. Mr. Stanley supported this opinion, and it was adopted; although Mr. Lawrence, in whom the novel plans of compression and flexion treatment have as yet not obtained a convert, was in favour of immediate operation.—*Med. Times and Gaz.*, July 2, 1859.

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*Amputation of the Leg after Resection of Ankle.*—Amongst the cases of interest which have recently been treated in King's College Hospital, is that of a man, aged 26, under Mr. Bowman's care, for whom excision of the astragalus and malleoli had been performed about three years before. The resection operations had been performed by the late Mr. Statham; and had been two in number, the first consisting in the removal of the astragalus, and the second in sawing off the malleoli and gouging the surface of the tibia. Although at first a cure had been hoped, yet the diseased processes had continued in the tibia to such an extent as to prevent any use of the limb. A single sinus remained. When admitted under Mr. Bowman's care, the man wished to have amputation performed, and to this wish Mr. Bowman acceded. On March 26 amputation was performed, Mr. Teale's method (by rectangular flaps, one short and one long) being adopted. With regard to the amputation we need not say more than that it answered well, and that the man recovered with a good stump. On dissection of the foot, the under surface of the tibia was found united to the tarsal bones by firm ligamentous tissue. The astragalus was wholly wanting.

There are of course not a few exceptions to the remark, but we fear that the above case is but too good an example of the usual result after resection of the ankle-joint. For the wrist and ankle, where many bones, and those consisting of porous structure, have to be interfered with, the operation of excision seems but ill-adapted. We have seen some very good results after it, but we have seen still better after-treatment by rest and constitutional measures only. The surgeon's knife and saw, and, above all, his gouge, are but too liable to extend the carious ulceration which they are intended to remove. We have repeatedly seen cases of this class disappoint the surgeon's hopes after an infinity of care and trouble, and come to amputation at last.—*Med. Times and Gaz*, July 30, 1859.

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*Useful Plan of supporting Stumps after Amputation.*—At Guy's Hospital for the last two years Mr. Hilton has been in the habit of supporting the stumps of amputated thighs in a manner which is worthy of notice, from its cleanliness and convenience, together with the comfort accruing to the patient. It consists in applying a short and broad splint under the stump, which is elevated at an angle of forty degrees; beneath the splint is a small cushion, and a light bandage is applied over all. This permits of examination and dressing without the slightest disturbance to the patient, and the stump always looks clean and healthy. The cases in which it is at the present moment employed are the following:—

A young man, twenty-two years of age, was admitted on the 23d March for extensive pulpy degeneration of the synovial membrane of the left knee, with incipient disease of the lungs. The former had existed for twelve months, and was making rapid in-

roads upon his health. The thigh was removed at its upper third on the 23d ultimo; and when we examined the stump on the 5th instant, it had almost entirely healed, and looked remarkably clean and healthy from the way in which it was put up. The phthisical symptoms have completely subsided.

A second case was that of a man, aged forty-eight years, who, as we gather from the notes of Mr. Tuck, his dresser, was kicked by a horse on the knee twenty-one years ago, causing at that time a wound over the patella. He has been subject to frequent attacks of pain and swelling ever since. Three years ago the symptoms generally increased. Seven weeks back an abscess was opened at the side of the knee, and subsequently two openings had to be made to let out pus from the joint. The bones were much diseased, and he had suffered most acute pain. Considering his age and other circumstances, Mr. Hilton thought the most prudent course was amputation through the thigh, which he performed on the 5th instant, under chloroform. When placed in bed, the stump of this patient was carefully put up by Mr. Tuck in the manner already described, and we learn that he is going on extremely well.—*Lancet*, July 16, 1859.

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*Double Fistula in Ano, treated by a single division of the sphincter.*—Although at first sight it may seem to be a trifling matter, whether one or more divisions of the sphincter ani muscle be made in cases of complicated fistula about the anus, in reality considerable importance should be attached to it if the future comfort of the patient is considered. There can be no doubt whatever, as we heard Mr. Fergusson remark, at King's College Hospital, on the 2d instant, that if there are two or more divisions of the sphincter muscle, subsequent union does not permit of such an amount of control over its functions as when one only is made. Being aware of the truth of this from experience, he treated the case of a young woman, who had what might be called a double fistula, in the following manner: Three years ago she had an abscess in the perineum, which burst externally at the margin of the anus; probably a second formed, which also burst externally, but the two cavities merged into one. This aperture, on examination, was found not to communicate with the rectum, and was, therefore, what is called, in surgical language, *a blind external fistula*, with a double opening. Instead of running a bistoury through the sphincter in two places, as we have seen done by some surgeons, Mr. Fergusson divided the skin between the fistulæ, and laid open the cavity to which they were the outlets. He then cut through the sphincter nearest the upper fistulous opening, in the usual manner, and the wound was carefully dressed from the bottom. Thus, by a very simple proceeding, the case was converted into one of ordinary fistula in ano.

The practical surgeon will at once recognize the benefits to be derived from an avoidance of multiple divisions through the sphincter ani.—*Ibid.*

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*Fissure of the Anus.*—One of the most painful affections situated in the neighbourhood of the anus, is a fissure alongside of the sphincter. When examined, scarcely any lesion is to be detected; but on rendering the structures tense, a very small slit with reddened margins may be observed, and from which there may be a little secretion. This apparently trifling malady occasionally causes the most intense agony. Latterly, several examples have come under Mr. Hancock's care at the Charing-cross Hospital, which have been effectually cured by the division of a few of the muscular fibres of the sphincter at the situation of the fissure. It is unnecessary to divide the entire sphincter in the treatment of this affection, and it is now seldom resorted to. On the 2d instant, this operation was repeated by Mr. Hancock on a woman twenty-seven years of age, whose sufferings have been very great for nearly twelve months, from the presence of a fissure of the kind mentioned. On passing her motions, the sensation was compared to that of a knife running through her. When we saw her on the 7th, five days after the operation, she expressed herself as completely relieved; all pain had gone, her health had generally improved, and she was beginning to assume a cheerful aspect. Patients with a fissure of the anus have a careworn and anxious expression of countenance, more so than is observed in fistula of the bowel; but it quickly disappears when surgical relief has been obtained. —*Ibid.*

*Orchitis of an Undescended Gland.*—It not unfrequently happens that when the descent of the testis is delayed until a period of life closely bordering on puberty, inflammation and considerable inconvenience attend its escape through the external ring. We have seen such swellings mistaken for hernia, and a truss applied, to the great aggravation of the boy's suffering. An extreme instance of orchitis, under the condition alluded to, came under notice at Guy's Hospital the other day. A rather puny, thin boy, aged 12, applied, with a countenance and whole bearing expressive of great discomfort, on account of a swelling in one groin. He was stooping forwards, and evidently moved with the greatest difficulty. On examination, Mr. Bryant, under whose care he was admitted, found that no testis was as yet present in the left side of the scrotum, and that in the left groin, just within the grip of the pillars of the external ring, was a swelling about the size of a bantam's egg. The swelling was excessively tender, and there could be no doubt that it was the undescended testis in a state of inflammation. The boy said that he had had pain in the groin for two weeks, but that the swelling had only commenced three days ago. He was taken into the hospital and put to bed. Ice was applied, and opium administered, and after a short time the swelling of the gland had subsided.—*Med. Times and Gaz.*, July 30, 1859.

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*After-treatment of the Extraction of Cataract.*—The old method of bandaging the eyes is never practised in the Central London Ophthalmic Hospital, and the modern one of plastering the eyelids is adopted in its stead. The object is to keep the eyelids motionless and closed, in order that the edges of the wound in the cornea may be kept in accurate adaptation by the gentle pressure of the eyelids. If a patient can keep his eyes shut, no appliance is needed; but few can do this. As the bandages are ordinarily applied, they are useless. To make them potent as bandages, would demand a degree of pressure that must be injurious. Very much annoyance is often produced from the cloth being stuck to the cheek by the aqueous humour when it trickles away; and the night's rest is broken in consequence. A couple of straps of court plaster, the eighth of an inch wide, accomplish all that is desired. Mr. Walton generally allows them to remain for a week; but if any unpleasantness is complained of, such as stiffness or hardness, they are removed after the third or fourth day. To this plan, which is wholly unobjectionable, Mr. Walton attaches much value; and he is convinced that the highest attainable results from the operation of extraction cannot be obtained without it. He always keeps the eyelids closed till the aqueous humour no longer escapes from the corneal wound; that is, till the cornea is quite healed. At the end of the week, when the patient has opened the eye, Mr. Walton does not raise the lid himself, but desires the patient to open the eye naturally, which he considers far preferable; he again closes it, if requisite, with court plaster for some days. There can be no doubt of the prudence of this. Many an instance of prolapse of the iris, with all the irritation and ulterior consequences, has been produced by the use of the eye before there has been proper reunion. Young operators are often sadly puzzled to account for the secondary imperfection of prolapse of the iris, after they have had such promising results when the eye was looked at a few days after the operation. This is the solution: the eye is used far too soon, and by the action of its own muscles, the prolapse is occasioned.

The great proof of cicatrization of the cornea is the fulness of the anterior chamber. So long as the iris is pressed forwards, and there is not the natural accumulation of aqueous fluid, the eye should be kept closed. A very little attention will enable the practitioner to decide this point.

When the iris is wounded in the operation of extraction, prolapse is very apt to occur under any condition; hence, Mr. Walton lays it down as a rule, that much pains should be taken to prevent the accident. He considers it far better on every occasion to finish the operation with the secondary knife rather than to complete it with the cataract knife, when by so doing the iris is at all injured. The late Mr. Alexander, than whom there never was a better operator, always made the section of the cornea with two knives. As soon as he had effected the counter-puncture with Wenzel's knife, he withdrew it, and completed the section with the secondary knife.—*British Medical Journal*, July 16, 1859.

## CLINICAL LECTURES.

*Practical Clinical Remarks on Congenital Hernia, complicated with an Undescended Testis*, delivered at University College Hospital, By JOHN ERICHSEN, Esq., Surgeon to the hospital.

Gentlemen: I wish to make some observations upon a case of strangulated congenital hernia, complicated with undescended testis, which came into the hospital a few days ago. In order to render these remarks more intelligible than they might otherwise be, I must first briefly describe that condition of things which allows a congenital hernia to occur. The testes are, as you know, in the fœtus contained within the abdomen, and only descend into the scrotum a short time before birth, the involution of peritoneum which they carry with them becoming the tunica vaginalis. At first the cavity of the tunica vaginalis communicates freely with the peritoneal cavity; but the aperture of communication becoming occluded by a natural process, which takes place during the latter part of intra-uterine life, and which is generally complete at birth, these cavities continue distinct and separate. It occasionally happens, however, that, either in consequence of the descent of the testis being retarded, or the natural process of occlusion not taking place, the cavities of the tunica vaginalis and peritoneum remain continuous. In this state of things it is not uncommon for a knuckle of intestine to slip into the tunica vaginalis, and lie in contact with the testis, thus constituting the ordinary form of congenital hernia. The testis, you will observe, occupies the scrotum, and the intestine falls into the tunica vaginalis. This form of congenital hernia requires no special consideration, and I mention it merely in order to say that it is not the form which I am about to describe to you.

The second form of congenital hernia is that in which the hernia is complicated by, and lies in contact with, a testis, which either does not descend at all, remaining an abdominal organ, or else becomes engaged in the internal abdominal ring or inguinal canal, but never descending beyond the external abdominal ring; this condition of the organ, whether the testis be lodged within the abdomen, or become engaged in the abdominal ring or inguinal canal, constituting the malformation termed undescended testis. In such a state of things as this the genital organs may be perfectly developed, and the sexual propensities and instincts exist. The scrotum, however, remains empty on one or both sides, though the testis is often lower in the canal on one side than on the other.

The case to which I wish to direct your attention is one of this description, but of something more than this, being complicated with a hernia. Before going into the particulars of this case, I will briefly recapitulate the different conditions under which an undescended testis may present itself to the surgeon.

The first of these is that of a small, hard, painless tumour, the size of a small walnut, in the inguinal canal, which may readily be mistaken for a hernia. The scrotum, however, is empty upon the corresponding side, or on both sides; and the tumour, instead of being smooth and uniform like a hernia, is more or less nodulated, and hard to the feel, and is not reducible. There is no gurgling in the tumour, and when pinched, the peculiar sickening sensation characteristic of injury of the testis is complained of by the patient. Sometimes it will be found that a truss has been worn under the impression that the tumour was a hernia.

The second of these conditions is that of a testis in the inguinal canal becoming inflamed. Inflammation of an undescended testis lying in the inguinal canal, is a condition of great surgical interest and importance in a diagnostic point of view, and is not unfrequently mistaken for strangulated hernia, as in the following case:—

About ten years ago, I was called up one night by the house-surgeon to see a man who had been sent up from the country to be operated upon for hernia. On reaching the hospital, I found him in a warm bath, and the house surgeon engaged in employing the taxis. On inquiring into the case, I was told that the patient had had a swelling in the right groin for a year or two, and had worn a truss, on the supposition that it was a hernia; but the pressure of the pad causing great uneasiness, he had left it off from time to time when at work. On the preceding day, he had been attacked with colicky pains and vomiting, and the supposed hernia had become greatly swollen and painful. The taxis had already been employed, and caused him severe pain. On his admission, the house-surgeon took the

same view of the case as had been previously done in the country, and adopted the ordinary treatment for reducing a strangulated hernia. On examination, I found within the right inguinal canal a tumour nearly as large as the fist, hard and somewhat irregular below, soft and rather fluctuating above, lying completely above the external ring. Great pain was experienced when pressure was made upon the tumour. The left testis had descended; the right side of the scrotum was empty. The patient had not vomited since his admission, and his bowels had acted in the morning. There was a good deal of pyrexia. From the feel of the tumour, the empty scrotum on one side, and the general symptoms, I came to the conclusion that this was merely a case of inflamed testis in the inguinal canal. I ordered him to be bled in the arm to eight or ten ounces, to have a dozen leeches applied to the tumour, followed by hot fomentations to the abdomen, and an aperient enema. Under this antiphlogistic treatment, the pain and other symptoms subsided, the swelling alone remaining, though in a much diminished form.

This is a good instance of inflammation of a testis retained in the inguinal canal, a condition which is not unattended with danger; for cases are on record in which the inflammatory action extending to the peritoneum has occasioned death. The proximity of the inflamed testis to the peritoneum, and the liability to implication of that membrane, must, therefore, be borne in mind in these cases. The symptoms which present themselves in such cases—the colicky pains and tenderness about the abdomen, the nausea, and possibly vomiting—are due to the compression of the inflamed testis by the congested and somewhat unyielding tissues amongst which it is lying, and are too often aggravated by repeated attempts at the taxis improperly made. Under ordinary antiphlogistic treatment they soon pass off. Should an operation be performed on suspicion that there is a strangulated hernia in the canal above the undescended testis, before very positive symptoms of strangulation have shown themselves, it will probably happen that no intestine is found, but that the patient will be exposed to the same danger as if a hernia had existed, the tunica vaginalis investing the undescended testis being in direct communication with the peritoneal cavity, which will thus be opened. No operative procedure should, therefore, be had recourse to, unless positive symptoms of strangulation have unequivocally manifested themselves.

The third condition in which an undescended testis may present itself, is in the form of a sarcocele in the inguinal canal, where it may undergo morbid degeneration, simple or malignant, as readily as in the scrotum. In such a case as this you will have a solid indolent tumour, progressively increasing in size, lying in the canal, there being no testis in the scrotum, on the side of the tumour. Such a mass as this may be removed. I have never had occasion myself to do this operation, but it has been successfully performed, amongst others, by Mr. Storks, whose early retirement from the surgical profession is so much to be regretted.

The fourth and last condition of things of which I have to speak, is when a congenital hernia is complicated with an undescended testis. The testis lies in the inguinal canal, probably as low down as the external abdominal ring, and above this a knuckle or loop of intestine has slipped into the canal, forming a hernial tumour—that is to say, a congenital hernia, above and behind an undescended testis. So long as the intestine is not strangulated, this complication is likely to escape observation; but when once strangulation has set in, the local signs and constitutional symptoms render it at once manifest.

I have had two cases of the kind in my own practice lately, which I will briefly relate to you. The first was one to which I was called by my friend, the late Dr. Pretty. A young gentleman, about fifteen years of age, residing at Islington, while playing at leapfrog, felt a sudden pain in the groin, of a very severe and sickening character. In the evening he vomited; and, on the following morning, the symptoms having become urgent, Dr. Pretty proceeded to examine him for hernia. He found the right testis had not descended, while the left had. The right inguinal canal was occupied by a tense, elongated tumour. The lad's parents were not aware of the non-descent of his testis, though he himself knew it, but had kept it a secret. Dr. Pretty sent for me in the course of the afternoon. I found a tumour in the right inguinal canal, extending as far as the external ring, but not below it. It could be divided

into two parts, the lower one rather hard and irregular, the upper small, not larger than half a walnut, tense, and elastic. There were the ordinary signs of strangulation: vomiting of bilious matter and constipation, with dragging pains in the abdomen. The treatment which had been resorted to had produced no good effect. I, therefore, proceeded to operate; and, having exposed the tumour, and let out a quantity of clear serous fluid from the tunica vaginalis, found at the upper part a small knuckle of intestine, tightly constricted by the inner ring. This was divided, and the gut reduced; the testis was left *in situ*, it not being desirable to reduce it. The boy had a sharp attack of peritonitis; but, under the influence of leeching, and calomel and opium, made a good recovery.

The second case happened the other day. Last Friday evening I was sent for to see a young, strongly-built man, who had been sent up to this hospital from Luton, and who stated that he was suffering from a hernia. From the notes of the case, which is very fully reported in the case-book, it appears that on the Wednesday previous he had been at a fair, and had stayed out late, and that next morning, while at work at the plough, he suddenly felt a lump in his right groin, and was soon after attacked with bilious vomiting. The tumour soon became painful, and several unsuccessful attempts were made to reduce it. About nine months ago a similar tumour had appeared in the same situation, but had been easily reduced, and he had neglected to wear a truss.

I saw him about eleven P. M. The scrotum was empty on both sides, neither testis having descended, and there was nothing, not even a retained testis, in the left inguinal canal; but in the right inguinal canal was a tumour, somewhat oval in shape, smooth and uniform, slightly elastic, very tender to the touch, though not the seat of any great pain. It was doubtful whether this was merely an inflamed testis, or whether it was one complicated with a hernia; but as symptoms of strangulation had not declared themselves, his countenance being good, his pulse only 78, his having had no vomiting since admission, the abdomen being flat, and there being but little pain and no tension about the tumour, I did not feel myself justified in operating at once. I accordingly ordered a dozen or eighteen leeches to the tumour, fomentations to the abdomen, a full dose of calomel, and an aperient enema. During the night sickness came on; he did not keep down the aperient medicine which was administered, and his bowels did not act. In the course of the afternoon, the symptoms becoming more urgent, I proceeded to operate. There was nothing unusual in the incision, except that it had to be made higher up than ordinary, and disclosed a dark tumour, distended with bloody serum, which proved to be the tunica vaginalis, forming the sac of a hernia; a loop of intestine, about three inches in length, being tightly constricted at the internal ring. The stricture was, I think, the tightest I ever met with, and I had to lay open the inguinal canal, in order to divide it safely without wounding the gut. Behind the loop of intestine was found an undescended ill-developed testis; this was left where it was. The patient became low and depressed after the operation, and on the following morning had an attack of vomiting, and died apparently in a state of syncope soon after.

On examining the body after death, we found no peritonitis; the loop of intestine was of a deep maroon colour, filled with flatus, and with one or two patches of lymph upon the surface, but evidently in a condition that would have recovered itself. The right testis, that on the side of the hernia, was in a state of inflammatory congestion, being of a dark purplish colour, and double the size of the other, its epididymis being very considerably larger, though short, hard, and imperfectly developed. It was surrounded by a distinct tunica vaginalis, and had probably remained in the canal for some time. The left testis lay entirely within the abdomen, looking very much like an ovary, and was very small and imperfectly developed, of a pale, dull white colour.

Before concluding, I may mention that, so far as my experience goes, operations for strangulated congenital hernia are, as a rule, highly unsuccessful. The mortality is greater after operations for this form of hernia than for any of the other varieties of inguinal rupture. The reason of this I believe to be, in a great measure, that the stricture is peculiarly tight, that it is always situated in the neck of the sac (and that does not admit of external division), and that, the hernia lying in an unclosed tunica vaginalis, the peritoneal cavity is necessarily extensively opened up.—*Lancet*, July 9, 1859.

# MEDICAL NEWS.

## DOMESTIC INTELLIGENCE.

*New Anæsthetic—Bisulphide of Carbon.*—Dr. Wm. H. Uhler, of Falls of Schuylkill at a recent meeting of the Academy of Natural Sciences, mentioned that he had a short time before accidentally inhaled the vapour of the bisulphide of carbon, which had produced complete anæsthesia. He was removed from the laboratory by the workmen in a completely insensible condition. He revived in a short time suddenly and completely, and he did not subsequently experience any nausea, or the least unpleasant symptom. Whilst in a state of anæsthesia, his visions were of the most pleasant and agreeable character.

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*Philadelphia Hospital, Blockley.*—The new Board of Guardians have reorganized the medical department of this institution. The office of chief resident physician has been abolished, and a Board of four visiting physicians, and the same number of surgeons and of obstetricians, has been constituted. The offices thus created have been filled as follows:—

*Visiting Physicians.*—Drs. J. L. Ludlow, W. Mayburry, C. P. Tutt, F. E. Luckett.

*Visiting Surgeons.*—Drs. D. H. Agnew, R. J. Levis, S. D. Gross, R. S. Kenderdine.

*Visiting Obstetricians.*—Drs. R. A. F. Penrose, L. D. Harlow, J. Wiltbank, W. D. Stroud.

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*Shelby Medical College.*—Dr. R. O. Currey has resigned the chair of chemistry in this school, and the vacancy has been filled by the election of Dr. Henry Erni.

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*Boylston Medical Prize.*—This prize, for 1859, has been awarded to Dr. Calvin Ellis, of Boston, for the best dissertation on "Tubercle—its pathology and especially its relation to inflammation."

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*Mortality in New York and Philadelphia.*—The mortality in New York during the past four weeks has been excessive, and for the week ending on the 20th of August, it was positively frightful, amounting to no less than 710, of which number 521 were children. There were 145 deaths from cholera infantum, and 78 deaths from other diseases of the bowels, making a total of 223 from bowel complaints. A portion of this mortality has been ascribed to the foul condition of the Croton water, but whatever it may be, it should be sought out and the cause removed.

The mortality in Philadelphia during the corresponding period has been even less than usual at this season of the year.

The following table exhibits the mortality in New York and Philadelphia during the past four weeks:—

| | New York. | Philadelphia. |
|---|---|---|
| Mortality in the week ending 30th July, | 616 | 261 |
| 6th August, | 625 | 243 |
| 13th " | 661 | 240 |
| 20th " | 710 | 205 |
| Total for four weeks, | 2612 | 949 |

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*Cleveland Medical Gazette.*—This is the title of a new monthly journal published at Cleveland, Ohio, edited by G. C. E. Weber, M. D., Prof. Surg. in Cleveland Medical College, of which the second number only has reached us.

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*The Physician's Visiting List, Diary, and Book of Engagements for* 1860.—We take pleasure in calling the attention of the profession to this highly useful annual, recently published by Messrs. Lindsay & Blakiston. Those who have once used it will, we are sure, consider a book of the kind indispensable, and we have seen none which for compactness and convenience excel this.

## FOREIGN INTELLIGENCE.

*Death from Chloroform.*—On the 18th of July last, chloroform was administered to a man, aged 45, in Westminster Hospital, who required incisions to be made in his penis and scrotum on account of extravasation of urine.

One drachm of chloroform was placed in the inhaler ordinarily used in the Hospital; but the inhalation of this quantity only produced partial anæsthesia. Half a drachm more was then added; and the patient seemed to pass comfortably into a state of unconsciousness. Mr. Holt then made the required incisions, which occupied about a minute, the inhaler having been removed just as he began to use the knife. Just as

the operation was completed, the pulse, which had been watched by Mr. Trend, the clinical assistant (who administered the chloroform with great care), ceased entirely, with only a slight preliminary fluttering. The respirations continued for a minute or two, and it was attempted to aid them by Marshall Hall's process; and, as soon as they ceased, tracheotomy was performed, and artificial respiration was kept up for more than half an hour by means of Dr. Marcet's apparatus. Galvanism and the other usual restorative measures were employed, but in vain; the pulse never returned. At the time that the first evil symptoms occurred, the breathing was going on well; and there was no congestion of the face. Failure of the pulse and livid paleness were the first indications of danger; and afterwards the breathing became weak and flurried. No convulsive movements occurred.

The post-mortem examination was made, on the following day, by Mr. Power, assistant surgeon, and Dr. Anstie, curator of the Pathological Museum. The body was large and well formed, but excessively loaded with fat. The rigor mortis was present to a moderate extent; the blood was everywhere quite fluid.

The lungs presented precisely the appearance which might have been expected after a prolonged use of artificial respiration, viz., slight distension of the air-cells, and considerable congestion in various parts; otherwise, they were quite healthy, and certainly had not been gorged with blood at the time of death. The heart contained a good deal of fluid blood, pretty evenly divided among its several chambers; but it could hardly be said to be "distended." Its muscular walls were very thin; and the muscular tissue was of a pale fawn colour, and extremely soft and friable. It was possible easily to push a finger through the wall even of the left ventricle. Portions of the muscular tissue of each auricle and ventricle were submitted to the microscope by Mr. Power and Dr. Anstie; and the existence of fatty degeneration, in a very high degree, was at once evident. The kidneys were found to be similarly affected, the convoluted tubes being full of granular molecules of fat. The brain was remarkably healthy, and presented no traces of congestion.

The following remarks have been appended to the history of the case by Dr. Anstie:—

"There can, of course, be no doubt that death was occasioned in this instance by paralysis of the heart. The important questions which remain for us are these: 1. Did the existence of such fatty degeneration as was present render cardiac palsy inevitable if chloroform were given? 2. Ought the existence of that condition to have been known to the administrator before giving the chloroform? 3. Was every precaution used in the administration?

"To the first of these questions, we may answer that it is impossible to say what amount of fatty degeneration of the heart contraindicates the use of chloroform. I myself have given it successfully in many cases where there is every reason to believe this affection was present. With regard to the possibility of always detecting the disease, every one knows that our diagnostic means are most unsatisfactory and insufficient for the purpose. Lastly, I am certain that every care was taken, in the administration itself, as regards the use of a moderate quantity of chloroform, the gradual induction of anæsthesia, etc. etc."—*Med. Times and Gaz.*, July 23, 1859.

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*Diphtheria in England.*—The latest report of the registrar-general, just published, shows that diphtheria still extensively prevails throughout England, breaking out occasionally in unexpected localities. In the southeastern counties, it has caused seven deaths out of a total mortality of fifteen at Guildford, one death being that of a medical man attending other cases of diphtheria. In the county of Kent, it killed nine out of thirty-three persons at Tonbridge, three at Barham, six at Deal. In Sussex, it killed five persons at Worth, eight at Wyke, four at Midhurst. In the eastern counties, it hangs about Essex and Norfolk, killing nine at St. Faith's, eight at Cromer, five at Depwade (four of whom were of one family), and others at Milford and Tunstead. In the west midland counties it was prevalent. At Bridgnorth, in Shropshire, eight deaths occurred from diphtheria; in Staffordshire, six deaths are reported at Tunstall; four at Burslem; two at Stroke upon Trent, six at Brewood, and six at Bilston. It is announced as fatal in Worcestershire and Warwickshire. In the north midland counties, the medical practi-

tioners of Lincoln are again called upon to combat this enemy. At Spalding, it has greatly added to the average mortality, which, for the last six months, has been nearly doubled. In Lincoln, twenty deaths from this cause have occurred; at Caistor, five; Stanford Bridge, five; and many others in surrounding districts. In the northwest, Sheffield returns twenty-six deaths from diphtheria; the districts in the East Riding, fifteen.

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*Death of the Queen of Portugal from Diphtheria.*—Letters from Lisbon give the following account of the fatal attack of diphtheria to which the young and graceful Queen of Portugal fell a victim: Shortly after returning home from a ride on the sands during a day of intense heat, the Queen complained of an indisposition, which was at first considered to be the result of a slight sunstroke, but which at last was recognized as diphtheria. The fatal disease ran its course, despite the able attendance of Dr. Gomez and the Baron de Silva, who tried the means best approved by medical art to save the royal sufferer. At this juncture, Dr. Simas, of the Misericordia, who has a special reputation for the treatment of disorders of this class, was called in; but he declared the case to be hopeless. The false membrane had extended along the air-passages, and terrible exhaustion was prepresent. As a last resource, however, tracheotomy was performed by the eminent surgeon, Barboza; but it was of no avail.—*Lancet*, Aug. 6, 1859.

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*New Disinfecting Composition.*—M. VELPEAU has recently communicated to the Academy of Sciences a paper from Drs. Demeaux and Corne, describing a disinfecting composition, which is said to be of great efficacy. It is introduced, with the *bravura* of scientific trumpeting, which is peculiar, on the other side of the Channel, to medical practitioners, who have furbished up an old notion, or had the good luck to hit upon a novel expedient, of which the eccentricity is but too often the chief merit, and which is only emulated here by the lessees of operatic or dramatic enterprise. We trust that the lofty claims which have been put forth may in some degree be realized on this occasion. This discovery, which is described as being of the "highest importance in surgery," and as entitling its inventors "to rank high amongst the benefactors of mankind," &c., consists in the application of a compound which "absorbs pus, and destroys its fetid smell," dispensing also with the necessity of employing lint. The prescription is as follows: Take one hundred parts of plaster of Paris, finely powdered; of coal-tar, from one to three parts, and mix in a mortar; add a sufficient quantity of olive oil to reduce the mixture to the consistence of ointment, and preserve for use in a close vessel. This mixture is of a dark-brown colour, and has a bituminous smell. The oil binds the powder without dissolving it, so that the compound retains its absorbing quality when placed in contact with a suppurating sore; and it never dries sufficiently to become inconvenient to the patient by its hardness; nor can it do any injury to the sore. The application may be immediate or mediate, according to circumstances. If applied immediately to the sore, it causes no pain, and has a detersive action favourable to cicatrization. The advantages which it offers are summed up as follows: 1. A gangrenous wound, emitting fetid and abundant pus, is at once deprived of its bad smell. 2. After a twenty-four or thirty-six hours' application, the bandages of a bad sore exhale no more smell than if they had been applied to a common fracture. 3. A cancerous ulcer is immediately deprived of its fetor. 4. The same is the case with ulcers of the legs. 5. Bandages and poultices charged with offensive pus are at once disinfected when brought into contact with the compound above described. 6. It also stops decomposition, keeps away insects, and prevents the generation of worms.

Drs. Chevreuil, Velpeau, and Cloquet have been appointed by the Academy to report on this composition.—*Lancet*, August 6.

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*Remarkable Luxation of the Eye.*—M. Reyssie relates the following case: During a conflagration the patient received the full stream from a fire-pump in his face. The column of water struck the eyelids of the right eye with violence, thrusting them strongly backwards. Contracting under the double influence of the shock and the cold, they forcibly compressed the globe, forcing it out of its orbit by a kind of enucleation. The author saw the patient in an hour, and found the eye hanging out, retained only by its muscles and the distended optic nerve. Its reduction was very easy. Local anti-

phlogistics and aperients were employed, and in the course of ten days he saw as well as before the accident. Seen thirty months after the accident he continued quite well.—*Med. Times and Gaz.*, June 25, from *Gaz. des Hôp.* No. 65.

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*Contagious Nature of Secondary Syphilis.*—A commission, composed of MM. Velpeau, Ricord, Devergie, Depaul, and Gibert, appointed to inquire concerning the contagious nature of the secondary accidents of syphilis, has decided (with the exception of M. Ricord, who reserves himself on certain points): 1. That there are secondary or constitutional accidents of syphilis manifestly contagious; and of these accidents in an especial manner the mucous pustule or flat tubercle. 2. That this rule applies to the nurse and the child she suckles, as well as to others; and there is no reason to suppose that the product of these accidents has different characters in the child at the breast of one what it has in the adult.—*Ibid.*

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*Population of Cities.*—Within the actual limits of Paris there are 1,174,346 inhabitants. The suburban communes, comprising 351,189, after the projected extension of the boundaries to the line of fortifications, the population will number 1,525,535. Paris is by far the most populous capital on the continent, inasmuch as Vienna has but 475,000 inhabitants, St. Petersburg 550,000, Berlin 430,000, Madrid 260,000, Lisbon 284,000, Naples 480,000, Constantinople 630,000, and Milan 160,000. London is the only capital in Europe more populated than Paris, numbering 2,400,000 inhabitants.—*Med. Times and Gaz.*, April 30, 1859.

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*Cholera in England.*—The cholera is again here, and it has arrived by the old route, from Hamburg. One case proved fatal last week on board one of the Hamburg steamers on her passage; another was sent to the *Dreadnought*, and died there, also from a Hamburg vessel; and a third died in a Hamburg vessel on the Thames. Dr. McWilliam, who is doing duty temporarily for Sir Wm. Pym, the Superintendent-General of Quarantine, has done all that he is empowered to do by having vessels from Hamburg boarded at Gravesend, and suspicious cases of disease removed to the *Dreadnought*, or elsewhere, and similar instructions have been sent to our eastern and northeastern ports; but beyond this the Privy Council will not act. The mischief is probably done by this time, and we are not likely to escape an autumn epidemic of cholera; but we have a strong conviction that it would be well to keep all vessels arriving in England from Hamburg, or from any port infected with cholera, under observation for at least three days before admitting their passengers to land in this country. This could lead to no very great inconvenience or loss, and it would surely be better to err on the side of excessive caution than of culpable neglect.—*Med. Times and Gaz.*, Aug. 6th, 1859.

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*Cholera and Cholerine at Paris.*—Considerable alarm has been felt at Paris, under the idea that the cholera has reappeared. It is true that during the great heats a great number of cases have occurred, and several patients have been rapidly carried off. Cholerine, too, prevails on a large scale. Still the disease has not manifested the character of an epidemic; and there can be little doubt that this sporadic cholera will disappear, as the usually high temperature of the last few weeks has abated.—*Ibid.*

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*Cholera in Bombay.*—Between the 2d and 22d of June 683 persons, of whom six were Europeans, fell victims to cholera in Bombay; and at the departure of the last mail this fatal scourge raged with great violence.—*Ibid.*

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*Antigalactic.*—M. Van Horsbeck very gravely states that he has employed, for more than three years, without ever failing, the following method for arresting the secretion of milk:—

"I introduce into the end of a goose-quill a quantity of metallic mercury, closing the ends of it with sealing-wax. The woman suspends this little instrument in front of the sternum, and in less than twenty-four hours the secretion of the milk ceases entirely; the breasts two days afterwards taking their natural size!"

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*Statue of Morgagni.*—A subscription has been opened at Naples for the purpose of erecting a statue of Morgagni.

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*Statue of Dr. Jenner.*—A statue of Dr. Jenner, by Eugene Paul, has been cast in bronze and set up temporarily opposite to the river front of the Louvre.